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BRAIN STRUCTURE IN CHILDREN AND YOUNG ADULTS WITH PHENYLKETONURIA

Devante Morgan

Mentor: Desiree White

Phenylketonuria (PKU) is an inherited disorder in which metabolism of the amino acid phenylalanine is disrupted. Previous studies in pediatric populations suggest structural brain differences between (1) individuals with PKU relative to controls and (2) typically developing females relative to typically developing males. However, it remains unknown whether group (i.e., PKU vs. control) and gender interact to influence brain structure during development. To address this gap in the literature, two-way factorial ANOVAs were run evaluating the respective and interactive influences of group and gender on gray matter volume, whole brain surface area, and average cortical thickness in individuals with PKU (aged 7-18 years; N = 42, 24male) and controls (aged 7-21 years; N = 69, 31 male). Structural brain data were obtained using high-resolution magnetic resonance imaging (MRI) and semi-automatic cortical reconstruction in FreeSurfer. Results of analyses designated a main effect of gender, wherein gray matter volume and whole brain surface area were significantly greater in males relative to females. No other effects were significant. Further work is needed to clarify whether these results are stable across the developmental period.